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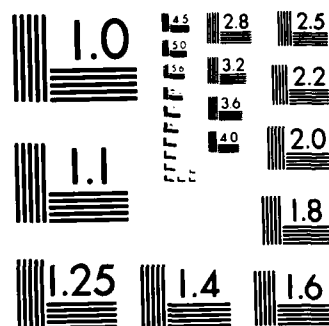
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MICROCOPY RESOLUTION TEST CHART
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February 1983

**LIST OF RAE TRANSLATIONS
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Compiled by

Patricia O. Flint

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ROYAL AIRCRAFT ESTABLISHMENT

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LIST OF RAE TRANSLATIONS ISSUED DURING THE PERIOD
1 APRIL 1981 TO 1 MARCH 1983

Compiled by
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SUMMARY

This list covers all RAE Library Translations published during 1981 and 1982, and follows Library Bibliography 380.

Previous lists have been issued in Library Bibliographies 243, 249, 254, 261, 283, 313, 319, 324, 330, 353, 360, 366, 369, 373 and 380.



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LIST OF TRANSLATIONS AND SUMMARIES IN NUMERICAL ORDER

2037 SWEDISH DEFENCE RESEARCH ABSTRACTS 78/79-4

Research Institute for
National Defence,
Stockholm

The Swedish Research Institute for National Defence issues a quarterly list of unclassified reports published by the Institute. The titles of these reports and informative abstracts have been translated in English. This volume is the fourth issue of 1978/79. Further volumes will be translated in due course. The main topics covered are: Protection - atomic, biological, chemical; ammunition and weapons; conduct of war, information and commands; vehicles and spacecraft; reliability and logistics; human factors; associated studies and their solutions; positive methods for limitation and control of armaments; psychology reports.

2057 STRENGTH BEHAVIOUR OF FATIGUE CRACKED LUGS
Dissertation Technical University Munich, 1980

W. Geier

The aim of this study is to examine the strength behaviour of an important constructional element, the lug, when fatigue cracked, and to propose a stress intensity solution considering the various lug geometries.

First the stress intensity is described on the basis of the linear-elastic principles, which is followed by showing their significance for the strength behaviour in fatigue cracked condition. The investigation of various methods for determining the stress intensity shows the crack propagation method to be particularly appropriate for the lug.

Due to a lack of suitable tests on cracked lugs, a gradual approach to the lug is made, starting with an infinite plate with a hole and continuing with a finite plate with and without pin loaded holes, since stress intensity solutions are already available in this case.

An experimental investigation of the lug not only enables the stress intensity to be determined, but also shows the interrelationship between the essential lug parameters, the crack propagation behaviour and the stress distribution in a non-cracked lug. Finally, it is possible to evolve a stress intensity solution for cracked lugs in the form of a semi-empirical approach, which takes into account the essential lug parameters.

2058 DETERMINATION OF THE SPECTRA OF MODULATED PULSE TRAINS BY
THE SPECTRAL FUNCTION METHOD
Izv. Vuz SSSR - Radioelektronika, XV, 5, 641-644 (1972)

M.V. Laufer
V.G. Strogii

A means is explained for determining the spectra of modulated pulse trains using the spectral function method. By this method a spectrum of signals is determined with a CHIM-2 frequency pulse modulation for a rectangular train of pulses.

2065 MECHANICAL IMPEDANCE OF THE HUMAN OUTER EAR
Forschungsbericht No.238 (1980)
Bundesanstalt für Arbeitsschutz und Unfallforschung

H. Els
J. Schröter

The current lack of a quick, cheap and accurate method of measuring the attenuation provided by hearing protectors has hampered the development of these devices. Many efforts to provide such a method have involved the design of an objective test apparatus or 'artificial head'. A major drawback to this solution has been the lack of detailed information about the mechanical characteristics of the skin/flesh layer at the point of contact between the protector and the head of a wearer.

This paper describes the measurement of the mechanical impedance of the skin/flesh layer of 100 subjects at four points in the circumaural region and at a point in the outer ear canal. The application of these data to the design of an artificial skin/flesh layer for use on an 'artificial head' is discussed.

- 2066 THE QUANTITATIVE DETERMINATION OF NON-METALLIC INCLUSIONS
BY A MATHEMATICAL STATISTICAL METHOD
Kash. Stali Splavy, 3, 38-42 (1978)

O.V. Rutes
S.B. Maslenkov
S.N. Kabuzenko
V.V. Topilin

It is useful to know the effect of different manufacturing processes on the micro-structure of a material. In this report a comparison is made between open arc and vacuum arc melting. The results are shown in terms of the effect on nitride inclusions and on the dispersion of dendritic structures. A statistical analysis of the results has been carried out in order to determine whether the results are significant. The heat resistant alloys CrNi56WMoTiAl (EP199) and CrNi67MoWTiAl (EP202) were used in the tests.

- 2067 THE STRUCTURAL FORMATION AND PHYSICAL BEHAVIOUR OF CROSS-
LINKED EPOXY RESINS
Makromol. Chem., 181, 1251-1287 (1980)

M. Fisher
F. Lohse
R. Schmid

Network structures and physical properties of products obtained either by cross-linking polyepoxides with polyphenols, and by dicyandiamide or by catalytic polymerization are discussed and compared with those obtained by amine or anhydride curing. The highest cross-linking density is achieved by the polymerization of epoxy compounds. In polymerization, the glass transition temperature may rise by more than $\Delta T_{gv} = 100$ K. Amine and phenol curing result in similarly structured networks with mobile aliphatic segments and comparatively low cross-linking densities. Impact resistance based on dissipation of mechanical energy increases as network density decreases, a maximum being achieved with a medium chain length of 25-35 atom intervals between cross-linking points. The mechanical stability of polymers is limited by the cohesive strength KF . This latter corresponds to the maximum shear strength of bonds TKF_{max} , which was measured within the temperature range of 77 K to 450 K, in accordance with the equation

$$TKF_{max} = KF = B - CT ; \quad T < T_g .$$

This equation was derived from Eyring's model of viscosity, correlating B and C with activation volume, activation energy, T_g and strain rate. B equals the cohesive strength at OK . It is determined by intermolecular forces but does not depend on the density of cross-linking. An increase of T_g due to cross-links or bulky segments causes a decrease of C and therefore a reduction of the temperature dependence of KF . Hence, cohesive strength at room temperature is improved.

- 2068 SWEDISH DEFENCE RESEARCH ABSTRACTS 80/81-1

National Defence
Research Institute,
Stockholm

The Swedish National Defence Research Council issues a quarterly list of unclassified reports published by the Institute. The titles of these reports and informative abstracts have been translated in English. This volume is the first issue of 1980/81. Further volumes will be translated in due course. The main topics covered are: Protection - atomic, biological, chemical; ammunition and weapons; conduct of war, information and commands; vehicles and spacecraft; reliability and logistics; human factors; associated studies and their solutions; positive methods for limitation and control of armaments; psychology reports.

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2070 FLYING AND DESIGN OF AIRCRAFT

J.-C Wanner

L'Aeronautique et l'Astronautique, 40, 10-18 (1973-2)

GENERAL GUIDELINE FOR THE DESIGN OF MANNED AEROSPACE VEHICLES

The Franco-British airworthiness authorities have been brought to review the set of technical specifications they intended to require for Concorde in order to insure the safety of the missions of this new transport aircraft. Most of the old rules of thumb generally used for the conventional aircraft appeared as obsolete or unapplicable to a supersonic transport.

In order to guide the definition of these new regulations, a theoretical method was developed for evaluating the reliability of the missions of manned aerospace vehicles.

This method called ESAU for "Etude de la Sécurité des Aéronefs en Utilisation" (a free translation of ESAU could be 'ISAAC' for "Investigations on Safety of Aircraft and Crews"), is based on an investigation of the way of occurrence of accidents. It has been seen that an accident is due to a set of incidents which can be classified into only three different types. The study of each type of incident, the probability of occurrence of which has to be reduced in order to increase the safety, is very useful to help the designer of a new project to choose between possible solutions, taking into account the reliability of the systems, the possible human errors and the flight conditions.

2071 IS GLASS FIBRE DANGEROUS TO HANDLE?

Dr Esquevin

Plastiques Renforcées Fibres de Verre Textile, 7, 8-15 (1980)

A review is given of the potential hazards of working with glass fibres. Minor irritations to skin and eyes occur and can be complicated by chemical effects due to fibre surface finishes. More serious hazards could be associated with respirable fibres less than 3 μm in diameter, and the most dangerous fibres are less than 0.25 μm in diameter and greater than 10 μm in length. However, unlike asbestos fibres which split parallel to their length, glass fibres break transversely and form less dangerous particles. Epidemiological studies and experiments with animals indicate that glass fibres are relatively safe but synergistic effects due to fibres and chemicals are potentially hazardous and recommendations are made on improvements to working conditions.

2072 SWEDISH DEFENCE RESEARCH ABSTRACTS 1980/81-3

National Defence
Research Institute,
Stockholm

The Swedish National Defence Research Institute issues a quarterly list of unclassified reports published by the Institute. The titles of these reports and informative abstracts have been translated in English. This volume is the third issue of 1980/81. Further volumes will be translated in due course. The main topics covered are: Protection - atomic, biological, chemical; ammunition and weapons; conduct of war,

information and commands; vehicles and spacecraft; reliability and logistics; human factors; associated studies and their solutions; positive methods for limitation and control of armaments; psychology reports.

- 2073 THE EFFECT OF CERTAIN FOREIGN MATERIAL INCLUSIONS ON THE
QUALITATIVE CHARACTERISTICS OF HIGHLY-CONCENTRATED ELECTRO-
RHEOLOGICAL SUSPENSIONS
Vestsi Akademii Navuk Belaryskai SSR, No.4 (1976)
Seryya Fizika Energetychnykh Navuk

B.F. Efimov
Z.P. Shul'man
R.G. Gorodkin

The results are given of an investigation into the effects of contaminants in highly concentrated electro-rheological suspensions. It is shown that Al-shavings, having dimensions of $\delta \leq 0.14$ mm and mass concentration up to 3 per cent, intensify the ER effect. Dielectric lubricating/cooling fluids, with mass concentration up to 5 per cent, show no essential change in rheological properties of ER suspensions. Similar aqueous fluids degrade the properties of the suspension. An explanation of the above phenomena is given.

- 2074 COMMERCIAL-IN-CONFIDENCE

- 2078 SWEDISH DEFENCE RESEARCH ABSTRACTS 80/81-4

National Defence
Research Institute,
Stockholm

The Swedish National Defence Research Institute issues a quarterly list of unclassified reports published by the Institute. The titles of these reports and informative abstracts have been translated in English. This volume is the Fourth issue of 1980/81. Further volumes will be translated in due course. The main topics covered are: Protection - atomic, biological, chemical; ammunition and weapons; conduct of war, information and commands; vehicles and spacecraft; reliability and logistics; human factors; associated studies and their solutions; positive methods for limitation and control of armaments; psychology reports.

- 2081 CHARACTERISTICS OF FATIGUE FAILURES IN FIBRE-REINFORCED PLASTICS
Z. Werkstofftech., 11, pp 343-360 (1980)

H.E. Franz

Macro- and micro-fractography studies have been made of static and fatigue failures in unfilled epoxy resins and glass and carbon fibre reinforced epoxy resin composites. Fatigue striations were observed in the resins, similar to those in metals and in the static specimens, parabolic cusps, Wallner lines and other features were observed.

Delaminated surfaces of the glass reinforced plastics showed fatigue striations of a different morphology to that in the unfilled resin. The author believes this to be the first time such striations have been observed in fibre composites with a fibre content of 70% by volume. The directions of the striations are closely analysed and from them conclusions are drawn about local stress distributions and local crack propagation in fibre composites.

2082 THE TOXIC NATURE OF GASES FROM THE THERMAL DECOMPOSITION
OF COMBUSTIBLE MATERIALS. PROTOTYPE TEST CHAMBER
AGARD Conference Proceedings No.309 (B8) Toxic Hazards
in Aviation, Toronto, Canada
(1980) pp B8-1-B8-10

P.E. Picart
J.P. Delcroix
M. Guerbet

When fire breaks out in the passenger cabin of an aircraft, escape is not immediately possible and it is necessary, first, to return to land. In this case toxic gases cause the major problem. For this reason it is necessary to select materials which will cause minimal toxicity in case of fire on board.

We have designed a test chamber giving sufficient control over the thermal decompositions of materials to reproduce real-life atmospheres as accurately as possible. This prototype must have the following specific characteristics:

- a relatively small enclosed volume;
- rapid renewal of the air (a total change in 3 minutes),
- the possibility of almost a total stoppage of ventilation,

in order that it should be capable of simulating those situations encountered in flight.

In this paper we describe the prototype test chamber made at the Centre d'Etudes et de Recherches de Médecine Aéronautique and we also give the first results obtained with it. The aim of this study is to be able, ultimately, and depending upon the danger criteria chosen, to supply bases against which selection of materials for the furnishing of aircraft cabins can be made.

2083 A LABORATORY MODEL FOR THE EVALUATION OF THE TOXIC NATURES
OF COMBUSTION PRODUCTS
AGARD Conference Proceedings No.309 (B16) Toxic Hazards
in Aviation, Toronto, Canada
(1980) pp B16-1-B16-14

J.M. Jouany
J.M. Presles
J. Pre

The evaluation of the toxic natures of the products arising from the thermal degradation of materials must be capable of giving a classification, from which the materials can be selected on the basis of the consideration of a certain number of criteria. We have tried to define a relatively simple screening method in comparison with the more complex biological examinations. A new oven is proposed which allows the speeds of combustion of the materials to be measured. Animal intoxications have been carried out on rats, either left with spontaneous ventilation (breathing) or placed under assisted ventilation (breathing). Different standards of observation have been chosen, such as LD50, incapacitation, EEG, ECG, arterial pressure, lecithins and alveole proteins. In the analysis of the results, transformation of all the raw values into their reduced, adjusted values, and the calculation of a modified Pearson index, allows the classification of the materials to be obtained by an overall index.

2085 SWEDISH DEFENCE RESEARCH ABSTRACTS 81/82-1

National Defence
Research Institute,
Stockholm

The Swedish National Defence Research Institute issues a quarterly list of unclassified reports published by the Institute. The titles of these reports and informative abstracts have been translated in English. This volume is the first issue of 1981/82. Further volumes will be translated in due course. The main topics covered are: Protection - atomic, biological, chemical; ammunition and weapons; conduct of war, information and commands; vehicles and spacecraft; reliability and logistics; human factors; associated studies and their solutions; positive methods for limitation and control of armaments; psychology reports.

- 2087 FINITE DIFFERENCE CALCULATION OF AN INVISCID TRANSONIC
FLOW OVER OSCILLATING AIRFOILS
Japan National Aerospace Laboratory TR-632, October 1980

T. Ishiguro

A procedure is presented to calculate the compressible inviscid unsteady transonic flow over an airfoil, which oscillates sinusoidally in pitch. In order to treat precisely boundary conditions on the oscillating airfoil surface and at infinity, the exterior of the airfoil-shaped contour in the physical plane is mapped onto a rectangle in a computational plane. The two-dimensional unsteady Euler equations are solved there by the Lax-Wendroff finite difference scheme with artificial viscosity. Test calculations were made for the unsteady flows over the Joukowski airfoil and the NACA 0012 airfoil oscillating in pitch, in order to obtain several individual flow patterns. The resulting unsteady pressure distributions, shock wave locations, etc are presented. Furthermore, the unsteady numerical results obtained by this procedure for the NLR 7301 airfoil and the NACA 64A010 airfoil are compared with the experimental ones by Tijdeman and Davis, respectively.

- 2088 STRUCTURE FORMATION OF ELECTRO-RHEOLOGICAL SUSPENSIONS IN
AN ELECTRICAL FIELD. I. QUALITATIVE CONSIDERATIONS
Vestsi Akademii Navuk Belaruskai SSR No.3, p.116-121 (1977)
Seryya Fizika Energetychnykh Navuk

Z.P. Shul'man
A.D. Matsepuro
B.M. Khusid

Based on the formerly conducted studies of electro-rheological suspensions and model particles, the reasons for an electro-rheological effect are discussed. An attempt has been made to follow the connection between the formation of strong bridge structures of particles in an electric field determining the character of the mechanical behaviour of suspensions and the peculiarities of charge transport in an adsorption activator on the surface of silica gel particles.

- 2089 STRUCTURE FORMATION OF ELECTRO-RHEOLOGICAL SUSPENSIONS IN AN
ELECTRIC FIELD. II. QUANTITATIVE EVALUATIONS
Vestsi Akademii Navuk Belaruskai SSR No.3, p.122-127 (1977)
Seryya Fizika Energetychnykh Navuk

Z.P. Shul'man
B.M. Khusid
A.D. Matsepuro

On the basis of the model of an interelectrode bridge which stretches with motion of one of the electrodes, the calculation of an increment of the shear stress in the Couette flow for an electro-rheological suspension with an applied electrical field normal to the shear planes has been carried out. The calculated results are compared with experimental data.

- 2090 THE ROLE OF BOUND WATER IN THE ELECTRO-RHEOLOGICAL EFFECT
Dopov. Akad. Nauk. Ukr. RSR, Ser. B. No.9, pp.807-10 (1975)

Yu. F. Deinega
K.K. Popko
N.Ya. Kovganich

Using a 25% suspension of potato starch in vaseline oil, the authors have studied the dependence of the electro-rheological effect upon hydration level of the disperse phase.

It is shown that as the moisture content of the disperse phase is increased, the electro-rheological effect passes through a maximum. As the electrical field intensity is increased, the positions of such maxima shift towards lower moisture levels. The I/V characteristic is non-linear.

It is to be noted that the electro-rheological maxima are attained at moisture contents consistent with the water being in a bound state.

2091 SWEDISH DEFENCE RESEARCH ABSTRACTS 81/82-2

National Defence
Research Institute,
Stockholm

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2092 SOME PROBLEMS OF THE ELECTRO-RHEOLOGY OF DISPERSED SYSTEMS
Masliny i Tekhnol. Pererab. Kauchukov Polimery i Rezinov
Smesei (Yaroslav) No.1, p.29-36 (1978)

Yu. F. Deinega

A qualitative review of some of the problems confronting a clear understanding of the electro-rheological effect and of some potential new applications of the phenomenon.

2096 SWEDISH DEFENCE RESEARCH ABSTRACTS 81/82-3

National Defence
Research Institute,
Stockholm

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REPORT DOCUMENTATION PAGE

Overall security classification of this page

UNLIMITED

As far as possible this page should contain only unclassified information. If it is necessary to enter classified information, the box above must be marked to indicate the classification, e.g. Restricted, Confidential or Secret.

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